



Board of County
Commissioners
Pete Gerken
President
Tina Skeldon Wozniak
Ben Konop

Emergency Medical
Services
Dennis Cole
Director

August 20, 2010

TO: ALL LUCAS COUNTY PARAMEDICS

FROM: Brent Parquette, NREMT-P
LCEMS Continuing Education Program

RE: **Continuing Education – September 2010**

In the month of September class time will be spent in a discussion of *AMA, Refusals, Treat-No-Transport, MC contact, and calls downgraded to BLS.*

Skill stations will once again emphasize the “team approach” to assessment and care. All efforts and interventions in the skill stations will be completed as if working on a real patient. We are looking for the “real-time” efforts required for skill completion. There will be 5 cardiac skill stations with 25 minutes per station allotted for completion. I ask that you review the following LCEMS protocols to help better prepare you for skill station participation:

Tab 100 – Operations Section

- Section P: On-Line Medical Control Contact
- Section Q: Patient Care Reporting (PCR) / On-Line Medical Control
- Section R: Refusal of Treatment or Transportation

Tab 500 – Medical Procedures / Equipment

- Section G: Cardioversion
- Section M: External Cardiac Pacing (TCP)

Tab 800 – Cardiac Protocols

- Section A: Asystole
- Section B: Atrial Fibrillation / Flutter
- Section C: Bradycardia
- Section F: Chest Pain / Acute Coronary Syndromes
- Section L: PEA
- Section M: STEMI Alert
- Section N: Supraventricular Tachycardia
- Section Q: Ventricular Tachycardia / Wide Complex with a Pulse
- Section R: 12-Lead ECG

Please take time to complete the attached pre-test. Annotated answers have been included for your review. A short post-test will be given at the end of each class.

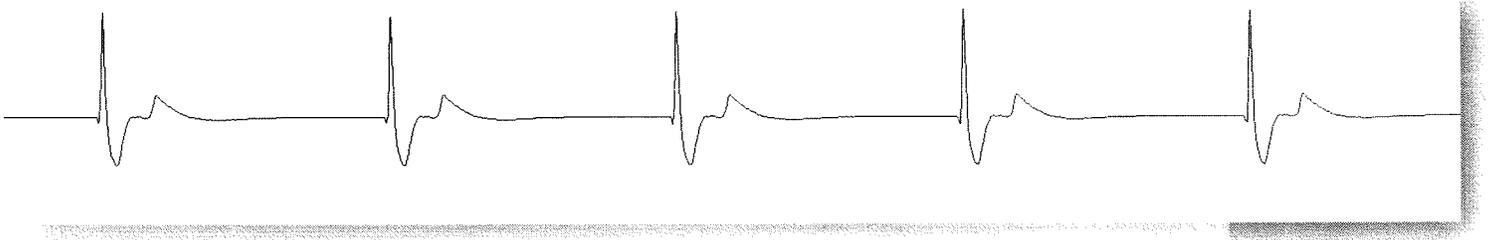
As always, if you have any questions or comments, please feel free to contact me by e-mail or phone. I look forward to seeing you in the coming month.

Brent
(419) 213-6508
bparquette@co.lucas.oh.us

September 2010 Pre-Test

Questions 1-3 refer to the following scenario:

Your patient is a 78-year-old male who collapsed in the bathroom while moving his bowels. He sits slumped on the toilet, moaning, pale, and extremely diaphoretic. He has no history of cardiac problems and takes no medications. His BP is 70 palpated, pulse 36, respirations 28 and shallow, lungs clear, and BS of 120. His ECG is shown below:



1. The most likely cause of this man's symptoms is:
 - a. Hypoglycemia
 - b. Decreased cardiac output
 - c. Narcotic overdose
 - d. Sympathetic overstimulation

2. His ECG strip is:
 - a. Junctional rhythm
 - b. Sinus arrhythmia
 - c. Sinus bradycardia
 - d. Idioventricular rhythm

3. The first prehospital treatment after initial assessment is:
 - a. Epinephrine IV
 - b. Adenosine IV
 - c. Atropine IV
 - d. Transcutaneous pacing

September 2010 Pre-Test

Questions 4-6 refer to the following scenario:

Your patient is a 35-year-old female who developed heart palpitations while exercising. She complains of lightheadedness and some dizziness. She denies any chest pain. She has a history of Wolff-Parkinson-White syndrome and takes Pronestyl. Her BP is 140/70, pulse 190, respirations 18, skin warm and dry, and lungs clear bilaterally. Her ECG is shown below:



4. This patient's rhythm is:
 - a. Sinus tachycardia
 - b. Ventricular tachycardia
 - c. Supraventricular tachycardia
 - d. Atrial Flutter

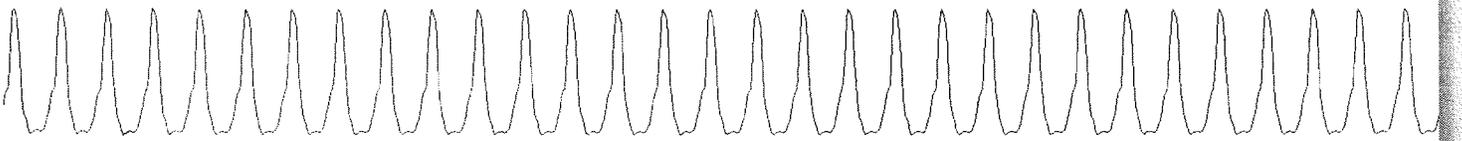
5. The probable cause of this dysrhythmia is:
 - a. Ectopic focus in the ventricle
 - b. Reentry focus in the atria
 - c. Compensatory mechanism
 - d. Sympathetic stimulation

6. The initial treatment of this patient includes oxygen and:
 - a. Immediate cardioversion
 - b. Immediate defibrillation
 - c. Vagal maneuvers
 - d. Cardizem IV

September 2010 Pre-Test

Questions 7-9 refer to the following scenario:

Your patient is a 67-year-old man who collapsed in the kitchen while cooking dinner. He presents on the floor, pale, clammy, and moaning, with vomit around his mouth. His wife states he has no history and takes no medications. His BP is 70/30, pulse 180 and weak, respirations 28 and shallow, lungs clear bilaterally, and BS of 120. His ECG is shown below:



7. His ECG is:
 - a. Ventricular tachycardia
 - b. SVT with aberrancy
 - c. Ventricular fibrillation
 - d. Idioventricular rhythm

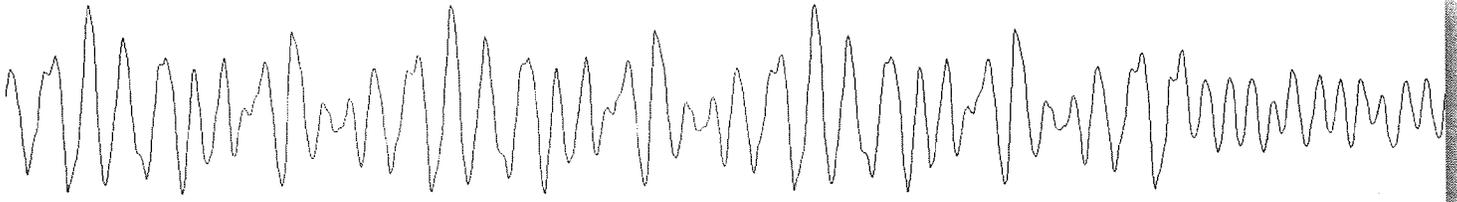
8. Initial management of this patient includes:
 - a. Immediate synchronized cardioversion
 - b. Aggressive airway management
 - c. Diazepam IV
 - d. All of the above

9. Which of the following drugs may be used on this patient?
 - a. Epinephrine
 - b. Cardizem
 - c. Naloxone
 - d. Procainamide

September 2010 Pre-Test

Questions 10-12 refer to the following scenario:

Your patient is a 45-year-old male who complains of chest pain and shortness of breath. During your workup, he suddenly loses consciousness and slumps over. He has no allergy to medications. His ECG is shown below:



10. Your patient's ECG rhythm reveals:

- a. Ventricular fibrillation
- b. Ventricular tachycardia
- c. Asystole
- d. Idioventricular rhythm

11. Your first move is to:

- a. Defibrillate at 200 Joules
- b. Deliver a precordial thump
- c. Begin CPR
- d. Check your patient

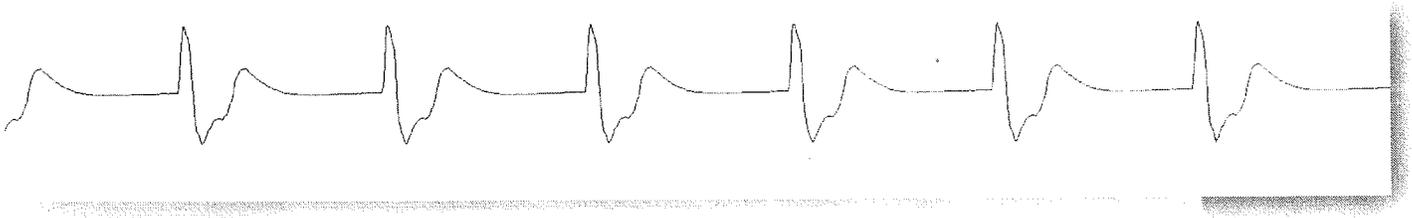
12. According to LCEMS protocol, pharmacological management of this patient includes which of the following drugs?

- a. Oxygen, Epinephrine, Atropine
- b. Oxygen, Epinephrine, Amiodarone
- c. Oxygen, Adenosine, Cardizem
- d. Oxygen, Epinephrine, Lidocaine

September 2010 Pre-Test

Questions 13-16 refer to the following scenario:

Your patient is a 99-year-old male found in cardiac arrest by his family. CPR was begun immediately and is ongoing upon your arrival. After a quick look, your patient is pulseless, apneic and unconscious. He presents with the following rhythm:



13. The patient's rhythm is:
- Supraventricular tachycardia
 - Idioventricular rhythm
 - Ventricular tachycardia
 - None of the above
14. This patient's condition is described as:
- AV dissociation
 - Pulseless electrical activity
 - Complete heart block
 - None of the above
15. Management of this patient includes all of the following EXCEPT:
- CPR and intubation
 - Epinephrine and Atropine IV
 - Defibrillation and Amiodarone
 - IV fluids
16. Causes for this condition include:
- Hypovolemia
 - Pericardial tamponade
 - Hypoxia and acidosis
 - All of the above

September 2010 Pre-Test

Questions 17-18 refer to the following scenario:

Your patient is a 65-year-old male complaining of malaise. He has no medical history and takes no medications. His BP is 120/70, pulse 60 and irregular, respirations 20, lungs clear, and skin warm and dry. His ECG is shown below:



17. This patient's rhythm is:

- a. Second-degree AV Block Type 2
- b. Second-degree AV Block Type 1
- c. Third-degree AV Block
- d. First-degree AV Block

18. Prehospital management of this patient includes:

- a. Oxygen and monitoring
- b. Oxygen, Atropine IV
- c. Oxygen, transcutaneous pacing
- d. Oxygen, Atropine, transcutaneous pacing

19. Stable Ventricular Tachycardia may terminate with an increase in vagal tone. Before administering pharmacologic therapy you can have the patient cough several times in an attempt to terminate the arrhythmia.

- a. True
- b. False

20. Symptomatic atrial fibrillation with an uncontrolled ventricular rate requiring pharmacologic therapy should be treated with:

- a. Adenosine 6mg rapid IVP
- b. Adenosine 12mg rapid IVP
- c. Cardizem 0.25mg/Kg
- d. Cardizem 25mg

September 2010 Pre-Test

21. Your patient is a 54-year-old male (100Kg) requiring TCP for a severely symptomatic bradycardia that is refractory to Atropine infusion. With a patient allergy to Versed voiced, according to LCEMS protocol, sedation for TCP should be accomplished by administering:
- Valium 10mg IV
 - Fentanyl 100mg IV
 - Valium 5mg IV
 - Fentanyl 50mcg IV
22. A 62-year-old (80kg) patient with symptomatic bradycardia requires a Dopamine infusion for hemodynamic support. With the given dosage of 10mcg/Kg/min, choose the appropriate drip rate to initiate for this patient:
- 15gtts/min
 - 30gtts/min
 - 45gtts/min
 - 60gtts/min
23. According to LCEMS Protocol which of the following dosing regimens is correct when administering Procainamide for a symptomatic ventricular tachycardia:
- 20mg/min until arrhythmia suppressed followed by 1-4mg/min maintenance drip
 - 30mg/min until arrhythmia suppressed followed by 1-4mg/min maintenance drip
 - 20mg/Kg slow IVP until arrhythmia suppressed followed by 5mg/min maintenance drip
 - 30mg/Kg slow IVP until arrhythmia suppressed followed by 4mg/min maintenance drip
24. According to LCEMS protocol, the initial adult joule setting for synchronized cardioversion in a symptomatic SVT scenario is:
- 25J
 - 50J
 - 75J
 - 100J

September 2010 Pre-Test

25. You are evaluating a 42-year-old male patient who presents with pallor, diaphoresis, severe fatigue, centralized anterior chest pressure, and relative hypotension. He has no previous medical history and takes no prescribed medications. His 12-Lead ECG reveals a left bundle branch block. According to LCEMS protocol, which of the following approaches to transport would be most appropriate:
- Declare a STEMI but transport to the closest hospital due to patient condition
 - Declare a STEMI and transport to the closest PCI facility
 - Does not fit STEMI criteria but should be transported to the closest PCI facility due to patient condition
 - Does not fit STEMI criteria and should be transported to the closest facility
26. Your 12-Lead tracing reveals ST-segment elevation of 3mm in leads II and III. You also notice ST-segment depression in leads aVL and I. Your diagnosis is:
- Acute anterior wall MI
 - Acute lateral wall MI
 - Acute inferior wall MI
 - Acute septal wall MI
27. 40-60% of AMI patients will not show indicative injury pattern change on the 12-Lead ECG for the first several hours after onset of symptoms:
- True
 - False
28. The pharmacologic agent of choice to achieve sedation for synchronized cardioversion or TCP is:
- Fentanyl 100mg
 - Valium 10mg
 - Versed 2mg
 - Morphine 10mg
29. Your 45-year-old male patient presents with bradycardia, hypotension, JVD, and complaint of respiratory distress with dry lung fields. From this presentation you would have a high index of suspicion for:
- Cardiogenic shock
 - Inferior wall MI with RVI
 - Stable angina
 - Prinzmetal's angina

September 2010 Pre-Test

30. According to LCEMS protocol, an adverse reaction to Cardizem infusion (hypotension, bradycardia, heart-block) is treated with:
- a. Epinephrine 1mg IV
 - b. Atropine 1mg IV
 - c. Glucagon 1mg IV
 - d. 1Gm Calcium Chloride drip

Pre-Test Answers / Rationale

1. **B.** The most common cause of this man's symptoms is decreased cardiac output from a decreased heart rate. Remember that cardiac output is rate times stroke volume. A decrease or increase in either component without compensation directly affects the cardiac output.
2. **C.** Junctional rhythms result from a dysfunction of the SA node. It can result from increased parasympathetic tone, SA node disease, or drug effects.
3. **D.** Treatment of a junctional rhythm is unnecessary unless hypotension or ventricular irritability is present. If treatment is required, administer 0.5mg bolus of Atropine Sulfate. This can be repeated every 3-5 minutes until a satisfactory rate has been obtained or 3mg of the drug has been given.
4. **C.** Supraventricular tachycardia occurs when rapid atrial depolarization overrides the SA node. It often occurs with sudden onset and may last minutes to hours.
5. **B.** Supraventricular tachycardia may be caused by increased automaticity of a single atrial focus or by reentry phenomena at the AV node.
6. **C.** Initial treatment of a patient in supraventricular tachycardia with stable vital signs includes administering oxygen and performing vagal maneuvers.
7. **A.** Ventricular tachycardia is a rhythm that consists of three or more ventricular complexes in succession at a rate of 100 beats per minute or more. This rhythm overrides the normal pacemaker of the heart.
8. **A.** Initial management of this patient includes immediate synchronized cardioversion.
9. **D.** According to LCEMS protocol, pharmacologic management of this patient would be procainamide delivered at 20mg/min. Other drugs utilized for control of ventricular tachycardia include Lidocaine and Amiodarone.
10. **A.** Ventricular fibrillation is a chaotic ventricular rhythm usually resulting from the presence of many reentry circuits within the ventricles. There is no ventricular depolarization or contraction.
11. **D.** The initial management of this patient is to check him clinically. Always correlate your patient's pulse with what you see on the ECG. In this case, a disconnected lead or faulty monitor could produce this ECG pattern. If you cannot detect a pulse, consider the rhythm ventricular fibrillation.
12. **B.** According to LCEMS protocol, pharmacologic management of the patient with ventricular fibrillation includes oxygen, Epinephrine, and Amiodarone.

Pre-Test Answers / Rationale

13. **B.** Ventricular escape rhythm or Idioventricular rhythm results when either impulses from the higher pacemakers fail to reach the ventricles or the rate of discharge of the higher pacemakers becomes less than that of the ventricles, normally 15-45 beats per minute.
14. **B.** When a patient with a rhythm has no associated pulse, this is known as pulseless electrical activity.
15. **C.** Management of a patient in Idioventricular rhythm with pulseless electrical activity includes CPR; airway management and oxygenation, including intubation; Vasopressin, Epinephrine, and Atropine IV; and rapid IV fluid administration.
16. **D.** Common causes for pulseless electrical activity include hypovolemia, hypoxia, acidosis, and cardiac tamponade.
17. **B.** Second-degree AV block type 1 (Wenkebach phenomenon) is an intermittent block at the level of the AV node. It produces a characteristic cyclic pattern in which the P-R intervals become progressively longer until an impulse is blocked or not conducted through the AV node. This cycle is repetitive. An identifying feature of second-degree AV block type 1 is a P-R interval that progressively lengthens until a QRS complex is dropped.
18. **A.** There is generally no treatment other than observation for patients in second-degree AV block type 1 with stable vital signs.
19. **A.** The cough produces increased intrathoracic pressure that may terminate the arrhythmia through an increase in vagal tone.
20. **C.** Per LCEMS protocol, symptomatic atrial fibrillation is treated with a slow Cardizem infusion of 0.25mg/Kg (not to exceed 20mg). A second dose may be given in 15 minutes at 0.35mg/Kg (not to exceed 25mg).
21. **D.** With a documented Versed allergy, sedation should be accomplished by administering Fentanyl 50mcg IV.
22. **B.** $80\text{Kg patient} \times 10\text{mcg} = 800\text{mcg/min drip or } 30\text{gtts/min.}$
23. **A.** For stable symptomatic ventricular tachycardia, administer Procainamide 20mg/min until the arrhythmia is suppressed, hypotension ensues, the QRS complex is prolonged by 50% from its original duration, or a total of 17mg/Kg of the drug has been given. Mix 1Gm Procainamide in a 50mL bag of D5W (20mg/mL). With (60gtt) administration set, run at 60gtts/min to achieve 20mg/min.

Pre-Test Answers / Rationale

24. **D.** Unstable SVT may require synchronized cardioversion starting at 100 joules. Escalate as necessary for rhythm conversion (100J – 200J – 300J – 360J).
25. **B.** The fact that this patient presents with hemodynamic compromise and BBB without previous documented cardiac history is suspicious for a new-onset BBB. Due to patient condition and BBB, STEMI criteria have been met and patient should be triaged to a primary PCI facility.
26. **C.** Leads II and III are anatomically contiguous views of the inferior wall of the left ventricle. ST-segment elevation would be indicative of AMI. The depression noted in lead avL and I are indicative of reciprocal change.
27. **A.** A significant number of patients will not show ECG changes indicative of MI for several hours following an acute coronary syndrome.
28. **C.** Per LCEMS protocol, the first agent of choice for sedation is Versed 2mg.
29. **B.** Inferior wall MI complicated by RVI (right ventricular infarction) should be suspected with the following triad of symptoms: relative or absolute hypotension; primary complaint of dyspnea with dry lung fields; JVD. Bradycardia can also be a common finding.
30. **D.** If a patient develops an adverse reaction to Cardizem infusion (i.e., hypotension, bradycardia, heart block), administer Calcium Chloride 1Gm over 5 minutes. Mix 1 Gm of Calcium Chloride in a 50mL bag of D5W. With (10gtt) administration set, run at 100gtts/min. Continue Calcium Chloride drip until adverse symptoms resolve.